Division, Fraction, Decimal

PH 3-6, 3-9, 3-10

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1 Division - Fraction - Ratio - Percent - Decimal

$$3 \div 12 = \frac{3}{12} = 3 : 12 = 25\% = 0.25 \tag{1}$$

2 Fraction

$$\frac{numerator}{denominator} \tag{2}$$

denominator: the total number of items

numerator: how many of that total are being considered.

- proper fractions, improper fractions, mixed fractions
- equivalent fractions
- simplify fractions by finding largest common factor between the numerator and the denominator.
- find common denominators for two or more fractions. (least common multiple)

2.1 Understand equivalent fractions

- Approach One: Dividing or multiplying by one

$$1 = \frac{3}{3} = \frac{7}{7} = \frac{10}{10} = \frac{a}{a} = \frac{a^n}{a^n} = \cdots \tag{3}$$

$$\frac{8}{12} = \frac{8}{12} \div 1 = \frac{8}{12} \div \frac{4}{4} = \frac{2}{3} \tag{4}$$

$$\frac{2}{3} = \frac{2}{3} \times 1 = \frac{2}{3} \times \frac{4}{4} = \frac{8}{12} \tag{5}$$

- Approach Two: treat a fraction as a division. Then use multiplication or division property (scale up or down):

$$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} = \frac{2}{3} \tag{6}$$

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12} \tag{7}$$

2.2 Operations of Fractions: addition, subtraction, multiplication, division

Q 1.

$$-\frac{8}{9} - (-\frac{9}{2}) =$$

Q 2.

$$-\frac{3}{2} + \frac{3}{8} =$$

Q 3. Elena is feeding her neighbor's dogs. Each dog gets $\frac{2}{3}$ cup of dog food, and she uses $3\frac{1}{3}$ cups of food. How many dogs does her neighbor have? Explain or show your reasoning.

Q 4. $5\frac{5}{8}$ cups of water fill $4\frac{1}{2}$ identical water bottles. How many cups fill each bottle? Explain or show your reasoning.

Q 5. A rectangle has an area of 24 square units and a side length of $2\frac{3}{4}$ units. Find the other side length of the rectangle. Show your reasoning.

3 decimals

decimals are special because, when written as fractions, their denominators are powers of 10. This is in line with our digit number system. Each number is out of 10, 100, etc.

All fractions can be changed to decimals.

$$0.3 = \frac{3}{10} \tag{8}$$

$$0.408 = \frac{408}{1000} \tag{9}$$

$$60.009 = 60\frac{9}{1000} \tag{10}$$